

## NATIONAL DIPLOMA: CLINICAL TECHNOLOGY

Qualification code: NDCT00 - NQF Level 6

Campus where offered: Arcadia Campus

### Important notification to new applicants:

Students who intend to enrol for this qualification for the first time in 2017 or thereafter, should note that it will not be possible to continue with any Baccalaureus Technologiae as from 2020, since it is being replaced by qualifications aligned with the newly-implemented Higher Education Qualification Sub-Framework. Potential students are advised to consult the University's website for any new qualifications which might not be published in this Prospectus.

### REMARKS

a. *Admission requirement(s) and selection criteria:*

• **FOR APPLICANTS WHO OBTAINED A SENIOR CERTIFICATE BEFORE 2008:**

**Admission requirement(s):**

A Senior Certificate or an equivalent qualification, with a C symbol at Standard Grade or an E symbol at Higher Grade for English, Mathematics, Physical Science and Biology or Physiology,

**Selection criteria:**

Prospective students will be selected for admission based on a TUT potential assessment, as well as an interview with a departmental selection panel.

• **FOR APPLICANTS WHO OBTAINED A NATIONAL SENIOR CERTIFICATE IN OR AFTER 2008:**

**Admission requirement(s):**

A National Senior Certificate with a bachelor's degree or a diploma endorsement, or an equivalent qualification, with an achievement level of at least 4 for English (home language or first additional language), 3 for Life Sciences, 3 for Mathematics and 3 for Physical Sciences.

**Selection criteria:**

To be considered for this qualification, applicants must have an Admission Point Score (APS) of at least **19**.

**Assessment procedures:**

Applicants with a score of 19 and more will be invited to do the TUT potential assessment and an interview. The APS will contribute 60% to the final admission score. The potential assessment and the interview will contribute 40%.

b. *Minimum duration:*

Three years.

c. *Presentation:*

Four semesters of day classes and two semesters of appropriate clinical training in a clinical unit accredited by the Health Professions Council of South Africa (HPCSA) and approved by the Department.

d. *Intake for the qualification:*

January only.

e. *Exclusion and readmission:*

See Chapter 2 of Students' Rules and Regulations.

f. *Recognition of Prior Learning (RPL), equivalence and status:*

See Chapter 30 of Students' Rules and Regulations.



- g. *Practicals:*  
100% attendance is compulsory for all practical classes. Students must pass the practical component of a subject to obtain admission to sit for the examination.
- h. *Textbooks:*  
Textbooks and other educational material will be required.
- i. *Personal protective equipment:*  
Specific safety wear is compulsory in the practical laboratories.
- j. *Other requirements:*  
Immunisation against Hepatitis B is compulsory. Transport to and from the accredited training venue is the student's own responsibility.
- k. *Registration as a student clinical technologist:*  
Registration with the HPCSA as a student clinical technologist is compulsory.
- l. *Professional registration as a clinical technologist:*
- A candidate may register as a qualified clinical technologist (under supervision) on the successful completion of the first three academic years.
  - International students will be allowed to register at the HPCSA only as student technologists for the duration of the relevant qualification. They will however not be able to register with the HPCSA as clinical technologists.
- m. *Clinical training (third year):*  
The Head of the Department reserves the right to train students in some of the seven categories after consultation with industry. Students will receive guidance in their second year on the available options for the following year. Clinical training must be completed at an accredited unit. During the training period, the student is subject to the jurisdiction of this unit. The duration of the clinical training is one year.
- n. *Subject credits:*  
Subject credits are shown in brackets after each subject.

Key to asterisks:

- \* Information does not correspond to information in Report 151.  
(Deviations approved by the Senate in August 2005.)

## CURRICULUM

### FIRST YEAR

CODE	SUBJECT	CREDIT	PREREQUISITE SUBJECT(S)
ANA100B	Anatomy I	(0,250)	
PSO100C	Physiology I	(0,250)	

### FIRST SEMESTER

CAL101T	Calculations and Statistics	(0,125)	
CHE141C	Chemistry IB	(0,125)	
PHU161C	Physics IB	(0,125)	

### SECOND SEMESTER

COA101C	Computer Applications I	(0,125)	
PDY101T	Psycho-Dynamics I	(0,125)	

TOTAL CREDITS FOR THE FIRST YEAR: **1,125**



**SECOND YEAR**

CODE	SUBJECT	CREDIT	PREREQUISITE SUBJECT(S)
BPR200T	Biomedical Apparatus and Procedures II	(0,250)	Anatomy I Physiology I
OSA200T	Organ and System Pathophysiology II	(0,250)	Anatomy I Physiology I
PMC200T	Pharmacology II	(0,125)	Chemistry IB

**FIRST SEMESTER**

APY211T	Anatomy and Physiology II	(0,250)	Anatomy I Physiology I
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TOTAL CREDITS FOR THE SECOND YEAR: **0,875**

**THIRD YEAR**

**One of the following seven options must be taken:**

CODE	SUBJECT	CREDIT	PREREQUISITE SUBJECT(S)
<b>OPTION 1: CARDIOLOGY</b>			
CBM300T	Cardiology: Biomedical Apparatus III	(0,350)	Anatomy and Physiology II Biomedical Apparatus and Procedures II
EXP3KKP	Cardiology: Clinical Technology Practice III	(0,300)	
KKP300T	Cardiology: Clinical Practice III	(0,350)	Anatomy and Physiology II
<b>OPTION 2: CRITICAL CARE</b>			
CBP310T	Critical Care: Biomedical Apparatus III	(0,350)	Anatomy and Physiology II Biomedical Apparatus and Procedures II
EXP3KSK	Critical Care: Clinical Technology Practice III	(0,300)	
KSK310T	Critical Care: Clinical Practice III	(0,350)	Anatomy and Physiology II
<b>OPTION 3: NEPHROLOGY</b>			
EXP3NRC	Nephrology: Clinical Technology Practice III	(0,300)	
NRB310T	Nephrology: Biomedical Apparatus III	(0,350)	Anatomy and Physiology II Biomedical Apparatus and Procedures II
NRC310T	Nephrology: Clinical Practice III	(0,350)	Anatomy and Physiology II
<b>OPTION 4: NEUROPHYSIOLOGY</b>			
EXP3NPC	Neurophysiology: Clinical Technology Practice III	(0,300)	
NPB310T	Neurophysiology: Biomedical Apparatus III	(0,350)	Anatomy and Physiology II Biomedical Apparatus and Procedures II
NPC310T	Neurophysiology: Clinical Practice III	(0,350)	Anatomy and Physiology II
<b>OPTION 5: PERFUSION</b>			
EXP3PFP	Perfusion: Clinical Technology Practice III	(0,300)	



PBD310T	Perfusion: Biomedical Apparatus III	(0,350)	Anatomy and Physiology II Biomedical Apparatus and Procedures II
PPF310T	Perfusion: Clinical Practice III	(0,350)	Anatomy and Physiology II

#### OPTION 6: PULMONOLOGY

EXP3KPU	Pulmonology: Clinical Technology Practice III	(0,300)	
KPU310T	Pulmonology: Clinical Practice III	(0,350)	Anatomy and Physiology II
PBP310T	Pulmonology: Biomedical Apparatus III	(0,350)	Anatomy and Physiology II Biomedical Apparatus and Procedures II

#### OPTION 7: REPRODUCTION\* BIOLOGY

EXP3KRE	Reproduction: Clinical Technology Practice III	(0,300)	
KRE310T	Reproduction: Clinical Practice III	(0,350)	Anatomy and Physiology II
RBA310T	Reproduction: Biomedical Apparatus III	(0,350)	Anatomy and Physiology II Biomedical Apparatus and Procedures II

TOTAL CREDITS FOR THE THIRD YEAR: **1,000**

TOTAL CREDITS FOR THE QUALIFICATION: **3,000**

### SUBJECT/MODULE INFORMATION (OVERVIEW OF SYLLABUS)

The syllabus content is subject to change to accommodate industry changes. Please note that a more detailed syllabus is available at the Department or in the study guide that is applicable to a particular subject/module. On 01 August 2017, the syllabus content was defined as follows:

#### A

#### **ANATOMY I (ANA100B) 1 X 3-HOUR PAPER**

*(Subject custodian: Department of Biomedical Sciences)*

Systemic anatomy, including osteology, anthropology, myology, neurology, angiology, splanchnology, surface anatomy and regional anatomy. Special emphasis is placed on the organ systems (Cardiovascular, Lymphatic, Urinary, and respiratory systems). (Total tuition time: ± 120 hours)

#### **ANATOMY AND PHYSIOLOGY II (APY211T) 1 X 3-HOUR PAPER**

*(Subject custodian: Department of Biomedical Sciences)*

An integrated study of micro-anatomy, physiological anatomy, physiology and physiological chemistry of the following systems: endocrine, nervous, reproductive. (Total tuition time: ± 60 hours)

#### B

#### **BIOMEDICAL APPARATUS AND PROCEDURES II (BPR200T) 1 X 3-HOUR PAPER**

*(Subject custodian: Department of Biomedical Sciences)*

General first aid. Patient monitoring. Clinical application of infusion. Medical terminology. (Total tuition time: not available)

#### C

#### **CALCULATIONS AND STATISTICS (CAL101T) 1 X 3-HOUR PAPER**

*(Subject custodian: Department of Mathematics and Statistics)*

General mathematics: algebra, calculations with pocket calculators. Graphs. Reduction of data to linear form. Trigonometry. Statistical calculations: basic descriptive statistics, elementary probabilities, the normal probability division. (Total tuition time: ± 45 hours)



**CARDIOLOGY: BIOMEDICAL APPARATUS III (CBM300T)****1 X 3-HOUR PAPER****(Subject custodian: Department of Biomedical Sciences)**

Haemodynamic monitoring techniques and specialised equipment. Blood-gas analysis equipment, arrhythmia monitoring apparatus. Intra-aortic balloon pump. Vector cardiography, echocardiography, exercise stress test, electrocardiography. Phonocardiography, nuclear cardiology. Pericardiocentesis. (Total tuition time: not available)

**CARDIOLOGY: CLINICAL PRACTICE III (KPK300T)****1 X 3-HOUR PAPER****(Subject custodian: Department of Biomedical Sciences)**

The electrocardiogram. Vector cardiography. Cardiovascular resuscitation. Intra-aorta balloon pump. The temporary pacemaker. Electro-physiological studies. Pericardiocentesis, cardioversion, cardiac catheterisation. Exercise stress test, electrocardiography, echocardiography, arrhythmia monitoring techniques. Phonocardiography. Nuclear cardiology. (Total tuition time: not available)

**CARDIOLOGY: CLINICAL TECHNOLOGY PRACTICE III (EXP3KPP) WORK-INTEGRATED LEARNING****(Subject custodian: Department of Biomedical Sciences)**

Practice-based competency tests of all the relevant cardiological procedures and skills. (Total tuition time: not available)

**CHEMISTRY IB (CHE141C)****1 X 3-HOUR PAPER****(Subject custodian: Department of Chemistry)**

Inorganic chemistry: atoms, molecules, periodic table, mole concept, chemical calculations, chemistry and elements of groups 1A, 4A, 5A, 6A. Organic chemistry: introduction, alkanes, alkenes, aromates, alkanols, phenols, halogen compounds, alkanoates, alkynes, aldehydes, ketones and alkanolic acids. (Total tuition time: ± 90 hours)

**COMPUTER APPLICATIONS I (COA101C)****CONTINUOUS ASSESSMENT****(Subject custodian: End User Computing Unit)**

Students have to acquire theoretical knowledge (computing fundamentals) and practical skills as an end-user in operating systems and MS Office suite applications (MS Word, MS Excel and MS PowerPoint) on an introductory level. Students will do online and computer based tests. The modules are mapped with SAQA and IC3 Essential Skills for Digital Literacy (international certification). (Total tuition time: ± 40 hours)

**CRITICAL CARE: BIOMEDICAL APPARATUS III (CBP310T)****1 X 3-HOUR PAPER****(Subject custodian: Department of Biomedical Sciences)**

Electrocardiography, invasive and non-invasive pressure monitoring, assessment of pulmonary volumes, measurements (pH, blood gas and electrolytes), treatment of respiratory failure, clinical anaesthesia, thermometry, assessment of homeostasis, infusion devices. (Total tuition time: not available)

**CRITICAL CARE: CLINICAL PRACTICE III (KSK310T)****1 X 3-HOUR PAPER****(Subject custodian: Department of Biomedical Sciences)**

Electrical safety, electrocardiography, cardio-pulmonary resuscitation, invasive and non-invasive pressure monitoring, assessment of pulmonary volumes, blood-gas sampling, arterial oxygen saturation, acid-base values, nebulisation, humidification, positive  $pO_2$ . (Total tuition time: not available)

**CRITICAL CARE: CLINICAL TECHNOLOGY PRACTICE III (EXP3KSK)****WORK-INTEGRATED LEARNING****(Subject custodian: Department of Biomedical Sciences)**

Practice-based competency tests of all the relevant critical-care procedures and skills. (Total tuition time: not available)

**N****NEPHROLOGY: BIOMEDICAL APPARATUS III (NRB310T)****1 X 3-HOUR PAPER****(Subject custodian: Department of Biomedical Sciences)**

History, development and theory of dialysis. Optimisation of therapy (blood/dialysate). Water treatment. (Total tuition time: not available)

**NEPHROLOGY: CLINICAL PRACTICE III (NRC310T)****1 X 3-HOUR PAPER****(Subject custodian: Department of Biomedical Sciences)**

Patient observation, blood transfusions, setting up disposable equipment, haemodialysis. (Total tuition time: not available)



**NEPHROLOGY: CLINICAL TECHNOLOGY  
PRACTICE III (EXP3NRC)**

**WORK-INTEGRATED LEARNING**

*(Subject custodian: Department of Biomedical Sciences)*

Practice-based competency tests of all the relevant nephrological procedures and skills. (Total tuition time: not available)

**NEUROPHYSIOLOGY: BIOMEDICAL APPARATUS III (NPB310T)**

**1 X 3-HOUR PAPER**

*(Subject custodian: Department of Biomedical Sciences)*

Electro-encephalogram, polysomnography, evoked potential recordings, electromyography. (Total tuition time: not available)

**NEUROPHYSIOLOGY: CLINICAL PRACTICE III (NPC310T)**

**1 X 3-HOUR PAPER**

*(Subject custodian: Department of Biomedical Sciences)*

Electro-encephalogram investigations, sleep recordings, polygraphic recordings, visual and somatosensory evoked potential studies, electromyographic studies. (Total tuition time: not available)

**NEUROPHYSIOLOGY: CLINICAL TECHNOLOGY  
PRACTICE III (EXP3NPC)**

**WORK-INTEGRATED LEARNING**

*(Subject custodian: Department of Biomedical Sciences)*

Practice-based competency tests of all the relevant neurophysiological procedures and skills. (Total tuition time: not available)

**O**

**ORGAN AND SYSTEM PATHOPHYSIOLOGY II (OSA200T)**

**1 X 3-HOUR PAPER**

*(Subject custodian: Department of Biomedical Sciences)*

Diseases of immunity. Fluid and haemodynamic derangements. Nutritional disorders. Systemic diseases. Infectious diseases. Introductory concepts with reference to the following systems: respiratory, circulatory, urinary, digestive, endocrine and reproductive systems, and nervous system and sense organs. (Total tuition time: not available)

**P**

**PERFUSION: BIOMEDICAL APPARATUS III (PBD310T)**

**1 X 3-HOUR PAPER**

*(Subject custodian: Department of Biomedical Sciences)*

Heart-lung machines, flow meters, vaporisers, thermometers, heating-cooling systems, safety apparatus, cardioplegia, oxygenators, cardiotomy reservoirs, filters, tubing, pressure monitoring systems, cannulas, suckers, sterilisation, blood gas and electrolyte analysers, draining systems, balloon pumps. (Total tuition time: not available)

**PERFUSION: CLINICAL PRACTICE III (PFP310T)**

**1 X 3-HOUR PAPER**

*(Subject custodian: Department of Biomedical Sciences)*

Determining the layout of the heart-lung machine, physiology of perfusion, laboratory equipment, emergency procedures, parameters during ECC. (Total tuition time: not available)

**PERFUSION: CLINICAL TECHNOLOGY PRACTICE III (EXP3PFP)**

**WORK-INTEGRATED LEARNING**

*(Subject custodian: Department of Biomedical Sciences)*

Practice-based competency tests of all the relevant perfusion procedures and skills. (Total tuition time: not available)

**PHARMACOLOGY II (PMC200T)**

**1 X 3-HOUR PAPER**

*(Subject custodian: Department of Pharmaceutical Sciences)*

Pharmacokinetics. Pharmacodynamics. Drug dosages, drug interactions, undesirable effects of drugs and medicines. Legislation. Primary health-care. (Total tuition time: not available)

**PHYSICS IB (PHU161C)**

**1 X 3-HOUR PAPER**

*(Subject custodian: Department of Physics)*

A general physics qualification with applications in the biological sciences: remedial mathematics, fundamental units, vectors and scalars, kinetics, mechanics, dynamics, momentum, work, energy and power, fluids, temperature and heat, gas laws, waves and sound, optics, electricity, magnetism, radioactivity. Practical: experiments related to the theory. (Total tuition time: ± 90 hours)



**PHYSIOLOGY I (PSO100C)****1 X 3-HOUR PAPER****(Subject custodian: Department of Biomedical Sciences)**

Homeostasis and control systems. Cell structure and function. Differentiation and reproduction. Structural organisation and intercellular material. Body fluid compartments. Review of special body fluids. An integrated study of micro-anatomy, physiological anatomy, physiology and physiological chemistry of different systems in humans. (Total tuition time: ± 120 hours)

**PSYCHO-DYNAMICS I (PDY101T)****1 X 3-HOUR PAPER****(Subject custodian: Department of Biomedical Sciences)**

Professionalism, ethics, developmental psychology, patient-care, applied psychology. (Total tuition time: not available)

**PULMONOLOGY: BIOMEDICAL APPARATUS III (PBP310T)****1 X 3-HOUR PAPER****(Subject custodian: Department of Biomedical Sciences)**

Spirometry, flow measuring devices, transducers, transcutaneous monitoring, gas chromatography, mass spectrometry, thermal conductive detectors, analysers (optical transmission, infrared, paramagnetic, Geissler tube, blood gas), lung functions, whole-body plethysmography, bronchoscopy. (Total tuition time: not available)

**PULMONOLOGY: CLINICAL PRACTICE III (KPU310T)****1 X 3-HOUR PAPER****(Subject custodian: Department of Biomedical Sciences)**

Sterilisation, electrical safety, gas laws, lung volumes, ventilation, spirogram, flow-volume curves, lung scans, whole-body plethysmography, diffusion, bronchodilators, bronchoscopy. (Total tuition time: not available)

**PULMONOLOGY: CLINICAL TECHNOLOGY PRACTICE III (EXP3KPU) WORK-INTEGRATED LEARNING****(Subject custodian: Department of Biomedical Sciences)**

Practice-based competency tests of all the relevant pulmonological procedures and skills. (Total tuition time: not available)

**R****REPRODUCTION: BIOMEDICAL APPARATUS III (RBA310T)****1 X 3-HOUR PAPER****(Subject custodian: Department of Biomedical Sciences)**

Laboratory equipment. Functioning of a computer-assisted sperm analysis (CASA) system. Microscopes. Photographic and videographic equipment. Maintenance of equipment. (Total tuition time: not available)

**REPRODUCTION: CLINICAL PRACTICE III (KRE310T)****1 X 3-HOUR PAPER****(Subject custodian: Department of Biomedical Sciences)**

Laboratory safety. Computer-assisted sperm analysis (CASA). Biomedical statistics, word processing and data management, sterility and quality control in the workplace, ethics and handling of laboratory animals, handling of chemicals in the reproductive biology laboratory. (Total tuition time: not available)

**REPRODUCTION: CLINICAL TECHNOLOGY PRACTICE III (EXP3KRE)****WORK-INTEGRATED LEARNING****(Subject custodian: Department of Biomedical Sciences)**

Practice-based competency tests of all the relevant reproductive procedures and skills. (Total tuition time: not available)

